Aug. 9, 1960 C. H. MacFARLAND 2,948,091

SAFETY DEVICE

Filed June 19, 1959 2 Sheets-Sheet 1

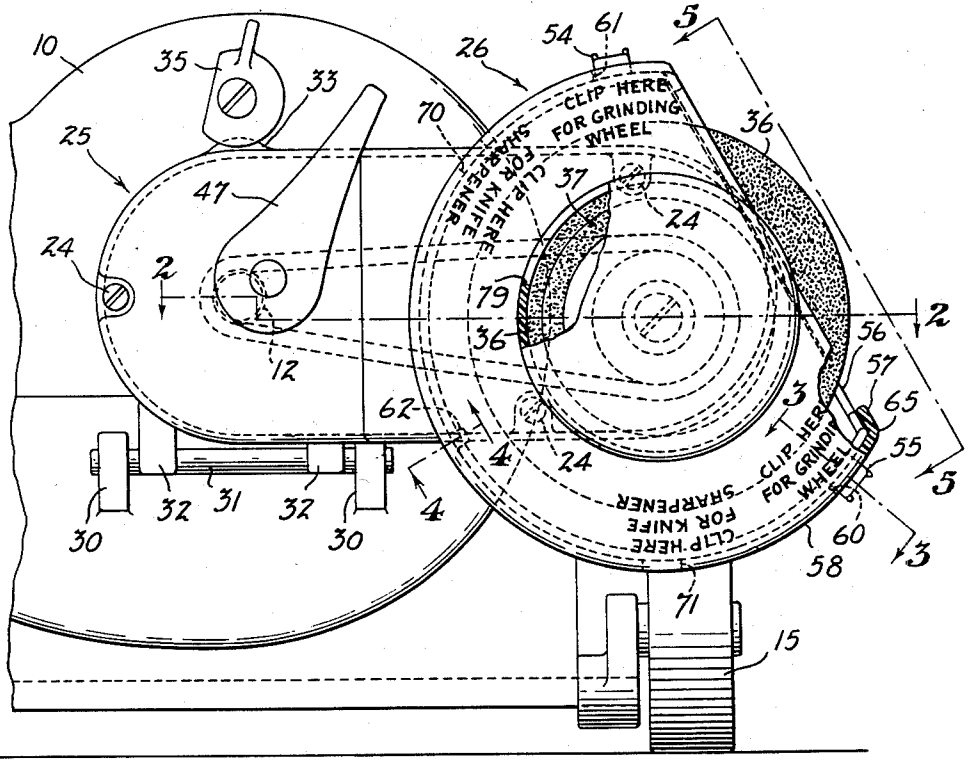


Fig. 1

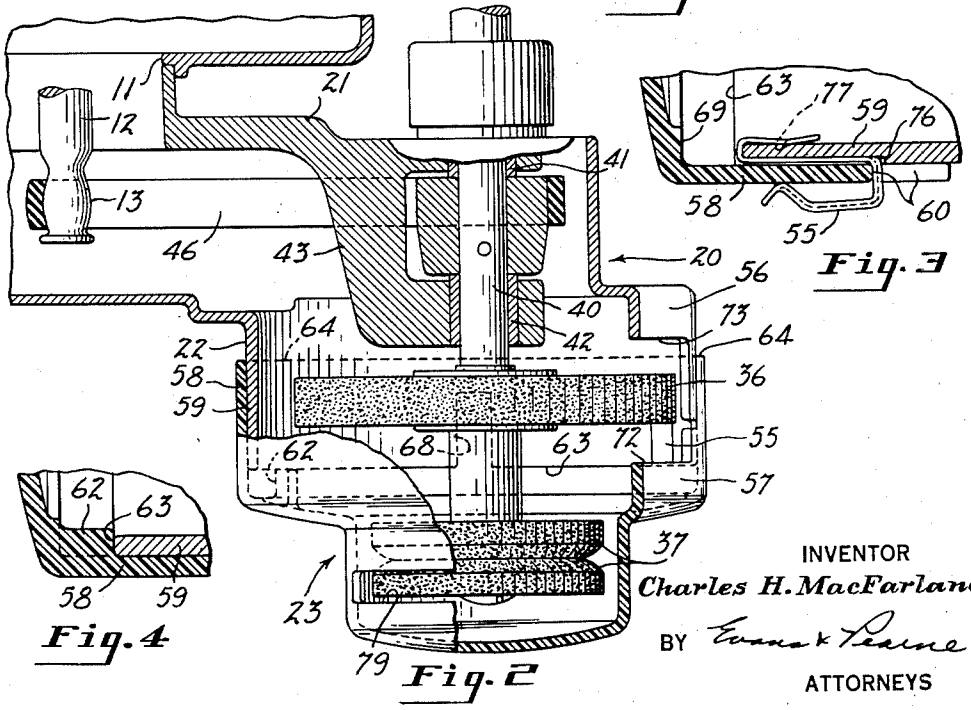


Fig. 2

Fig. 3

Fig. 4

INVENTOR
Charles H. MacFarland
BY Evans & Pearne
ATTORNEYS

Aug. 9, 1960 C. H. MacFARLAND 2,948,091

SAFETY DEVICE

Filed June 19, 1959 2 Sheets-Sheet 2

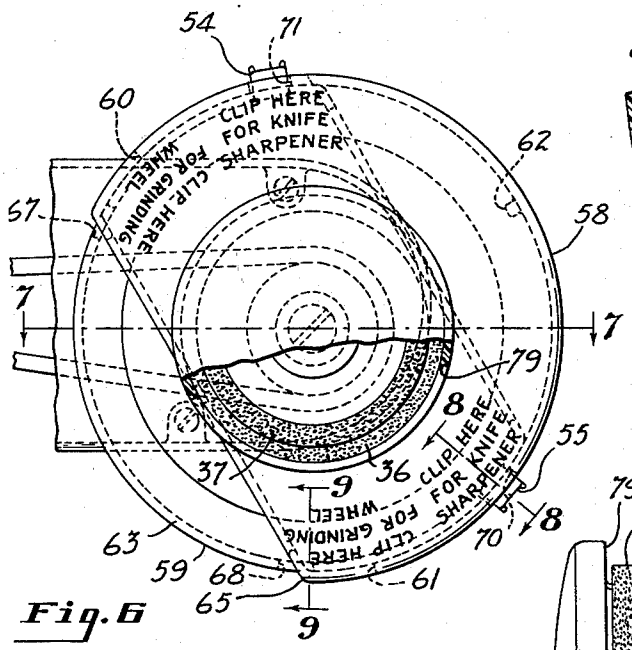


Fig. 6

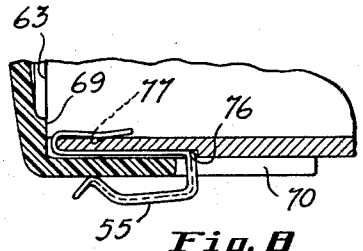


Fig. 8

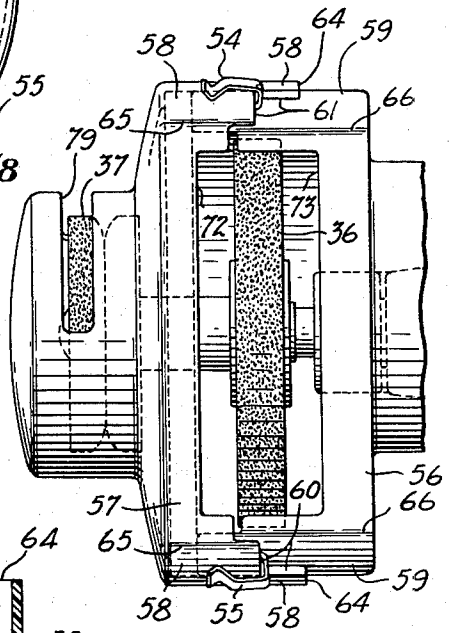


Fig. 5

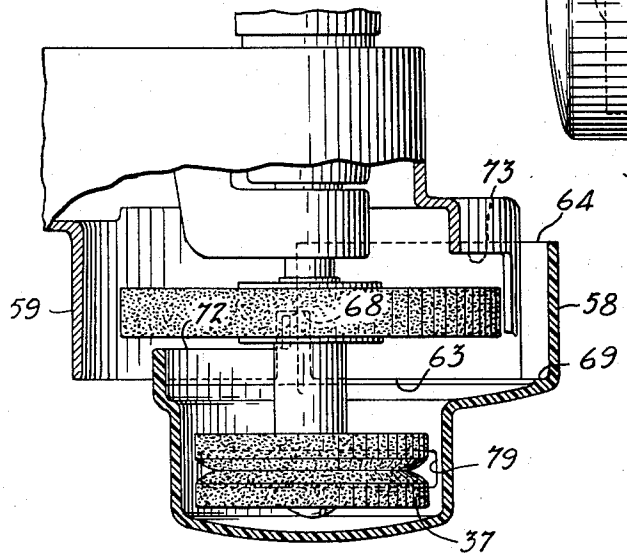


Fig. 7

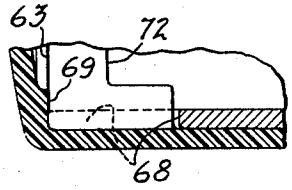


Fig. 9

INVENTOR

Charles H. MacFarland

BY *Evans & Pearne*

ATTORNEYS

United States Patent Office 2,948,091
Patented Aug. 9, 1960

2,948,091

SAFETY DEVICE

Charles H. MacFarland, Rocky River, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio, a corporation of Ohio

Filed June 19, 1959, Ser. No. 821,423

6 Claims. (Cl. 51—241)

This invention relates to a safety device for use on a housing means for a coaxial grinding wheel and knife sharpening wheel.

More particularly the invention relates to a safety device for use on vacuum cleaner accessories designed themselves to be employed with vacuum cleaners of the type having a fan casing with a vacuum opening for attaching a vacuum nozzle and a fan shaft that protrudes through the opening and has a belt-receiving portion outside of the fan casing which may normally receive the driving belt of the rotary brush in the vacuum nozzle. An example of such an accessory and a vacuum cleaner with which it is used is found in U.S. Patent No. 2,563,541.

In attachments of the above type and in other applications where a grinding wheel and a knife sharpening tool or equivalent multiple rotating abrasive members or the like are mounted on a common shaft, it is obviously desirable to minimize the dangers which may occur because of the improper use of abrasive tools or because of exposure to a moving tool which is not in use while operations are being performed with another tool. To this end, it is an object of the present invention to make more safe the use of coaxial multiple rotative abrasive tools such as sharpening wheels and grinding wheels and the like which are mounted on a common shaft.

A more specific object of the invention is to provide covering or shielding means for a coaxial pair of rotative abrasive tools which is so arranged as to prevent the simultaneous exposure of both the tools and which is readily adjustable to selectively and operatively expose one or the other of the tools.

The invention contemplates the provision of a tubular body portion and a tubular cover portion which are receivable in mating and seating engagement with each other in more than one relative angular position, the tubular portions being in surrounding relationship with rotating coaxially abrasive tool members which are exposed in different ways according to the relative angular position of the tubular portions.

While particular apparatus embodying the invention is illustrated in order that the invention may be readily understood, some of the details of the illustrated apparatus are not necessary to the invention, and changes, modifications and improvements may be adapted without departing from the general scope of the invention as defined in the appended claims.

In the accompanying drawings:

Figure 1 is a front elevation, partly broken away, showing a portion of a vacuum cleaner with an attachment contemplated by the present invention included thereon.

Figure 2 is a fragmentary horizontal section taken from the plane of line 2—2 in Figure 1.

Figure 3 is a detail sectional view on an enlarged scale taken from the plane of line 3—3 in Figure 1.

Figure 4 is another detailed sectional view taken on an enlarged scale from the plane of line 4—4 in Figure 1.

Figure 5 is a view taken from the plane of line 5—5 in Figure 1.

Figure 6 is a view similar to the right hand portion of Figure 1 but showing the safety device in a different condition.

Figure 7 is a fragmentary horizontal section taken from the plane of line 7—7 in Figure 6.

Figure 8 is an enlarged detail sectional view taken from the plane of line 8—8 in Figure 6.

Figure 9 is an enlarged detail sectional view taken from the plane of line 9—9 in Figure 6.

In the accompanying drawings the invention is shown as applied to a vacuum cleaner of conventional construction including a fan casing 10 having a vacuum opening 11 (Figure 2) which is normally used for the attachment of a vacuum nozzle and also having a fan shaft 12 which projects forwardly or outwardly through the vacuum opening 11 and which has a belt-receiving portion 13 which normally receives the driving belt of the rotary brush in the vacuum cleaner nozzle. The fan casing and vacuum cleaner chassis are supported on wheels, one of which may be seen in Figure 1 and is indicated by the reference numeral 15. The vacuum cleaner may be of the same general type, for example, as that shown in U.S. Patent No. 2,563,541.

The attachment has a housing or body generally indicated by the reference numeral 20 which includes a base casting 21, a secondary casting 22 and a detachable guard or cover 23. The casting 22 is fixed to the casting 21 by means of the bolts 24.

The housing 20 includes an attaching portion generally indicated by the reference numeral 25 and a tool shaft mounting portion generally indicated by the reference numeral 26. The attaching portion 25 is adapted to be received in registered relationship with the vacuum opening 11.

A pair of lugs 30 on the vacuum cleaner structure support a horizontal rod 31 which extends a short distance below the vacuum opening 11 of the fan casing. The attaching portion 25 of the attachment housing has laterally spaced, downwardly extending lugs 32 provided on their undersides with recesses adapted to receive the rod 31. On the upper side of the attaching portion 25 there is an upwardly projecting flange 33 which is adapted to be engaged by a locking detent or cam 35 to releasably lock the attachment to the vacuum cleaner.

The tool shaft mounting portion 26 is laterally offset from the attaching portion 25 and has mounted therein a tool shaft 40 which extends in a direction parallel to the fan shaft 12. The tool shaft 40 is journalled on a pair of bearings or bushings 41 and 42 which are spaced along the length of the shaft 40 and which are supported in the housing 20 and directly on the base casting 21, the bearing 42 being supported by an arm element 43 which forms part of the base casting 21. The shaft 40 is powered through the belt 46. A belt lifter 47 having a shoe (not shown) is adapted to lift the belt 46 from the portion 13 of the shaft 12 to enable ready insertion and removal of the housing 20.

Mounted on the shaft 40 and toward one end thereof in the illustrated embodiment of the invention are coaxial rotating abrasive tool members such as the grinding wheel 36 and the blade sharpening discs 37, which discs 37 together comprise a knife sharpening wheel, the operative portion of which is the groove defined between the pair of discs 37.

As so far described, the apparatus may be identical to that shown and described in my copending application Serial No. 758,859, filed September 3, 1958, with the exception of differences in the guard or cover 23 and in the immediately associated portion of the body casting 22, now to be described.

Extending as part of the secondary casting 22 of the housing 20 is a tubular body portion or wall 59. The

tubular body portion 59 is in surrounding relationship with the grinding wheel 36 and is coaxial therewith.

The cover 23 is positionable in surrounding relationship with the knife sharpening wheel 37 and has a tubular cover portion or wall 58 which is receivable in mating and seating engagement with the tubular body portion 59 in a manner to be more fully described below.

Received over the outer edge 63 of the body wall 59 are a pair of clips 54 and 55, which may be received slightly backwardly from the outer edge 63 by small edge notches as indicated in Figures 3 and 8, so that the portions of the clips 54 and 55 which pass around the edges 63 do not protrude therefrom in a longitudinal direction. The clips may be received in shallow clip grooves 76 as also indicated in Figures 3 and 8. They may be engaged against sliding movement of the cover portion or wall 58 by means of small pointed elements 77 struck in the radially inward leg of the clips 54 and 55.

The tubular body portion 59 and the tubular cover portion 58 each have a truncated side formed thereon. The tubular body portion 59 has at such truncated side a flat face 56 which is substantially open, the opening therein being defined by the edge 73 on the flat face 56. The intersection between the tubular wall 59 and the face 56 may be slightly rounded but is nevertheless indicated by the reference numeral 66. Correspondingly, the truncated side of the tubular cover portion or wall 58 has formed thereon a flat face 57 which is substantially open, the opening in said face being defined by the edge 72. The intersection between the tubular cover portion or wall 58 and the face 57 may be slightly rounded but is nevertheless indicated by the reference numeral 65.

Provided on the tubular cover portion 58 are a pair of shallow notches 60 and 61. These notches are termed shallow in the sense that they extend longitudinally (that is, in the direction of the axis of the shaft 40) a relatively short distance from the edge 64 of the cover wall 58. There is also provided a pair of deep notches 70 and 71 on the cover body 58, such notches extending a relatively greater longitudinal distance from the edge 64 of the tubular cover portion 58.

Located within the cover 23 is a leg 62 adapted to abut against the edge 63 in a first rotative position of the parts. Also provided within the cover 23 is a bottoming seat 69 against which the edge 63 of the body portion 59 may abut in seating relationship in a second relative position of the parts and as indicated in Figures 7–9.

A pair of notches 67 and 68 are provided in the body wall 59 and extend back from the outer edge 63 thereof.

Provided in the cover 23 is a slot 79 through which a knife blade or the like is inserted when the sharpening wheels 37 are to be used. The slot 79 will be seen to be aligned in the conventional manner along planes normal to the axis of the shaft 40.

In the first rotative position of the parts seen in Figures 1–5, the open faces defined by the edges 72 and 73 are in register with each other to expose the grinding wheel 36. In this rotative position the relatively shallow notches 60 and 61 bottom against the clips 55 and 54, respectively, and the leg 62 bottoms against the edge 63 to provide a stable three-point seating relationship between the tubular body 59 and the tubular cover 58. The cover slot 79 is longitudinally out of register with the operative portion of the sharpening wheel 37, that is, the groove thereof, as most clearly seen in Figure 5.

When the cover 23 is pulled outwardly to be released from the clips 54 and 55 and is rotated approximately 180° and then re-engaged in mating and seating relationship with the body 59, the clips 54 and 55 are received in the relatively deep slots 71 and 70, respectively, and the edge 63 of the body wall 59 engages in seating relationship with the bottoming seat or surface 69 of the cover 23 at a second relative axial position. In this position of the parts, the cover slot 79 is longitudinally in register with the operative portion of the sharpening wheel 37. Due to the deeper seating of the cover 23 on the body portion 59, the tubular wall 58 substantially covers the opening in the flat face 56 of the body portion, as most clearly seen in Figure 7, and the grinding wheel 36 is thereby covered to prevent inadvertent contact therewith during knife sharpening. In this second relative position of the cover 58 and body wall 59, the slots or notches 67 and 68 in the body wall 59 accommodate the wall identified with the flat face 57 on the cover. Without such notches, interference would occur, preventing the seating of the parts in the second relative axial position.

It will be noted that in the operative position of the cover slot 79, this slot is located on the lower side of the sharpening wheel 37. This is a desirable safety feature since it causes a knife to be thrown toward the floor or table top or the like, rather than toward the user in the event that grabbing occurs between the sharpening wheel 37 and the knife blade. However, the location of the cover slot on the top side of the device when in operative condition is contemplated in the broader aspects of the invention.

In either relative rotative position of the cover and body portions 58 and 59, suction created by the vacuum fan of the vacuum cleaner tends to draw air inwardly through all openings in the cover and body portions 58 and 59 to exhaust all loose particles created by grinding or sharpening.

The above description of the invention should make it apparent that many details of the apparatus embodying the invention may be varied without departing from the teaching of the invention. Accordingly, the scope of the invention is not to be limited to precise details of the specifically disclosed embodiments but is to be defined by the following claims.

What is claimed is:

1. In attachments for vacuum cleaners of the type having a fan casing with a vacuum opening for attachment of a vacuum nozzle and a fan shaft that projects through the opening and a belt receiving portion outside the casing and which include a housing having an attaching portion engageable in said vacuum opening in surrounding spaced relationship with said fan shaft, and a tubular body portion surrounding a tool shaft which is mounted in parallelism with said fan shaft and which has a grinding wheel and knife sharpening wheel mounted thereon, said tubular body portion extending as part of the housing in surrounding relationship with the grinding wheel and being coaxial with the grinding wheel, the improvement comprising a cover positionable in surrounding relationship with the knife sharpening wheel and having a tubular cover portion receivable in mating and seating engagement with said tubular body portion at first and second relative rotative positions of said cover portion with respect to said body portion, said seating engagement being deeper when the cover and body portions are engaged at said second relative rotative position than when they are engaged at said first relative rotative position, said tubular body portion and said tubular cover portion each having a truncated side defining an open face, a slot in said cover oriented along planes normal to the axis of the grinding and sharpening wheels, said open faces in said tubular cover and body portions being rotatively registered with each other to expose the grinding wheel and said cover slot being longitudinally out of register with the operative portion of said sharpening wheel when the tubular cover and body portions are in mating and seating engagement at said first relative rotative position, said open face of said tubular body portion being covered by said tubular cover portion and said cover slot being longitudinally in register with the operative portion of said sharpening wheel when the tu-

bular cover and body portions are in mating and seating engagement at said second relative rotative position.

2. A safety device for use on a housing for a coaxial grinding wheel and knife sharpening wheel comprising in combination a tubular body portion extending as part of the housing in surrounding relationship with the grinding wheel and being coaxial with the grinding wheel, a cover positionable in surrounding relationship with the knife sharpening wheel and having a tubular cover portion receivable in mating and seating engagement with said tubular body portion, said mating engagement being establishable at first and second relative rotative positions of said cover portion with respect to said body portion, said seating engagement being deeper when the cover and body portions are engaged at said second relative rotative position than when they are engaged at said first relative rotative position, said tubular body portion and said tubular cover portion each having a truncated side defining an open face, a slot in said cover oriented along planes normal to the axis of the grinding and sharpening wheels, said open faces in said tubular cover and body portions being rotatively registered with each other to expose the grinding wheel and said cover slot being longitudinally out of register with the operative portion of said sharpening wheel when the tubular cover and body portions are in mating and seating engagement at said first relative rotative position, said open face of said tubular body portion being covered by said tubular cover portion and said cover slot being longitudinally in register with the operative portion of said sharpening wheel when the tubular cover and body portions are in mating and seating engagement at said second relative rotative position.

3. A safety device for use on a housing for a coaxial grinding wheel and knife sharpening wheel comprising in combination a tubular body portion formed as a cylindrical body wall extending as part of the housing in surrounding relationship with the grinding wheel and being coaxial with the grinding wheel, a cover positionable in surrounding relationship with the knife sharpening wheel and having a cylindrical cover wall receivable in mating and seating engagement with said cylindrical body wall, said mating engagement being establishable at first and second relative rotative positions of said cover wall with respect to said body wall, said seating engagement being deeper when the cover and body walls are engaged at said second relative rotative position than when they are engaged at said first relative rotative position, said body wall and said cover wall each having a truncated side defining an open face, a slot in said cover oriented along planes normal to the axis of the grinding and sharpening wheels, said open faces in said cover and body walls being rotatively registered with each other to expose the grinding wheel and said cover slot being longitudinally out of register with the operative portion of said sharpening wheel when the tubular cover and body walls are in mating and seating engagement at said first relative rotative position, said open face of said body wall being covered by said cover wall and said cover slot being longitudinally in register with the operative portion of said sharpening wheel when the cover and body walls are in mating and seating engagement at said second relative rotative position.

4. In attachments for vacuum cleaners of the type having a fan casing with a vacuum opening for attachment of a vacuum nozzle and a fan shaft that projects through the opening and a belt receiving portion outside the casing and which include a housing having an attaching portion engageable in said vacuum opening in surrounding spaced relationship with said fan shaft, and a tubular body portion surrounding a tool shaft which is mounted in parallelism with said fan shaft and which has a grinding wheel and knife sharpening wheel mounted thereon, said tubular body portion being formed as a cylindrical body wall extending as part of the housing in surrounding relationship with the grinding wheel and being coaxial with the grinding wheel and terminating in an annular edge, a cover positionable in surrounding relationship with the knife sharpening wheel and having a cylindrical cover wall receivable in mating and seating engagement with said cylindrical body wall, said cylindrical cover wall also terminating in an annular edge, said mating engagement being establishable at first and second relative rotative positions of said cover wall with respect to said body wall, said seating engagement being deeper when the cover and body walls are engaged at said second relative rotative position than when they are engaged at said first relative rotative position, said body wall and said cover wall each having a truncated side defining an open face, a slot in said cover oriented along planes normal to the axis of the grinding and sharpening wheels, a pair of clips received along said annular edge of said cylindrical body wall, a first pair of relatively shallow notches extending longitudinally from said annular edge of said cylindrical cover wall, a second pair of relatively shallow notches extending longitudinally from said annular edge of said cylindrical cover wall, said pair of clips being received in said first pair of notches, said open faces in said cover and body walls being rotatively registered with each other to expose the grinding wheel and said cover slot being longitudinally out of register with the operative portion of said sharpening wheel and said pair of clips being received in said first pair of notches when the tubular cover and body walls are in mating and seating engagement at said first relative rotative position, said open face of said body wall being covered by said cover wall and said cover slot being longitudinally in register with the operative portion of said sharpening wheel and said pair of clips being received in said second pair of notches when the cover and body walls are in mating and seating engagement at said second relative rotative position.

5. In attachments for vacuum cleaners of the type having a fan casing with a vacuum opening for attachment of a vacuum nozzle and a fan shaft that projects through the opening and a belt receiving portion outside the casing and which include a housing having an attaching portion engageable in said vacuum opening in surrounding spaced relationship with said fan shaft, and a tubular body portion surrounding a tool shaft which is mounted in parallelism with said fan shaft and which has a grinding wheel and knife sharpening wheel mounted thereon, said tubular body portion being formed as a cylindrical body wall extending as part of the housing in surrounding relationship with the grinding wheel and being coaxial with the grinding wheel, a cover positionable in surrounding relationship with the knife sharpening wheel and having a cylindrical cover wall receivable in mating and seating engagement with said cylindrical body wall, said mating engagement being establishable at first and second relative rotative positions of said cover wall with respect to said body wall, said seating engagement being deeper when the cover and body walls are engaged at said second relative rotative position than when they are engaged at said first relative rotative position, said body wall and said cover wall each having a truncated side defining an open face, a slot in said cover oriented along planes normal to the axis of the grinding and sharpening wheels, said open faces in said cover and body walls being relatively registered with each other to expose the grinding wheel and said cover slot being longitudinally out of register with the operative portion of said sharpening wheel when the tubular cover and body walls are in mating and seating engagement at said first relative rotative position, said open face of said body wall being covered by said cover wall and said cover slot being longitudinally in register with the operative portion of said sharpening wheel when the

cover and body walls are in mating and seating engagement at said second relative rotative position.

6. A safety device for use on a housing for a coaxial grinding wheel and knife sharpening wheel comprising in combination a tubular body portion formed as a cylindrical body wall extending as part of the housing in surrounding relationship with the grinding wheel and being coaxial with the grinding wheel and terminating in an annular edge, a cover positionable in surrounding relationship with the knife sharpening wheel and having a cylindrical cover wall receivable in mating and seating engagement with said cylindrical body wall, said cylindrical cover wall also terminating in an annular edge, said mating engagement being establishable at first and second relative rotative positions of said cover wall with respect to said body wall, said seating engagement being deeper when the cover and body walls are engaged at said second relative rotative position than when they are engaged at said first relative rotative position, said body wall and said cover wall each having a truncated side defining an open face, a slot in said cover oriented along planes normal to the axis of the grinding and sharpening wheels, a pair of clips received along said annular edge of said cylindrical body wall, a first pair of relatively shallow notches extending longitudinally from said annular edge of said cylindrical cover wall, a second pair of relatively shallow notches extending longitudinally from said annular edge of said cylindrical cover wall, said pair of clips being received in said first pair of notches, said open faces in said cover and body walls being rotatively registered with each other to expose the grinding wheel and said cover slot being longitudinally out of register with the operative portion of said sharpening wheel and said pair of clips being received in said first pair of notches when the tubular cover and body walls are in mating and seating engagement at said first relative rotative position, said open face of said body wall being covered by said cover wall and said cover slot being longitudinally in register with the operative portion of said sharpening wheel and said pair of clips being received in said second pair of notches when the cover and body walls are in mating and seating engagement at said second relative rotative position.

References Cited in the file of this patent

UNITED STATES PATENTS

953,496	Stone	Mar. 29, 1910
2,748,543	Pardee	June 5, 1956